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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of

Proceeding to Address Satellite
Network Unwanted Emissions

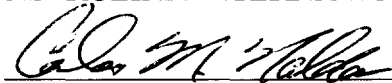
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) File No. RM-9740
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PETITION FOR LEAVE TO FILE

Astrolink International, LLC ("Astrolink"), by its attorneys, hereby submits this Petition for Leave to file the attached "Comments of Astrolink International, LLC" in the above-referenced proceeding.¹ An administrative oversight prevented the comments from being filed yesterday, December 20, 1999, as specified in the *Public Notice*. Because the attached comments have been submitted immediately upon discovery of the oversight and only one day after the date specified in the *Public Notice*, Astrolink respectfully requests that they be included in the docket of the proceeding.

Respectfully submitted,

ASTROLINK INTERNATIONAL, LLC



Carlos M. Nalda, Esq.

DOW, LOHNES & ALBERTSON, PLLC
1200 New Hampshire Avenue, N.W.
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Its Attorneys

December 21, 1999

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¹ See Proceeding to Address Satellite Network Unwanted Emissions, *Public Notice*, RM-9740, DA 99-2601 (rel. Nov. 19, 1999) ("*Public Notice*").

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Proceeding to Address Satellite)	File No. RM-9740
Network Unwanted Emissions)	
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**COMMENTS OF
 ASTROLINK INTERNATIONAL, LLC**

Astrolink International, LLC (“Astrolink”), by its attorneys, hereby submits its comments in response to the Commission’s request for comments in the above-referenced proceeding.¹

Astrolink is the licensee of the Astrolink™ System, a first-round Ka-band satellite system that will provide advanced broadband communications to businesses and consumers in the United States and around the world.

Astrolink supports the commencement of a rulemaking proceeding to update the Commission’s rules regarding satellite network unwanted emissions. The issues associated with appropriate limitations on satellite network unwanted emissions (comprised of spurious and out-of-band emissions) are highly technical, however, and therefore require careful study by the Commission and industry participants in the context of an FCC rulemaking.

As an initial matter, Astrolink believes that any new unwanted emission mask(s) adopted by FCC should not be unduly restrictive, particularly in view of practical and economic limitations and developments in satellite technology. The commercial satellite industry continues to develop new and innovative technologies that use spectrum more efficiently and

¹ See Proceeding to Address Satellite Network Unwanted Emissions, *Public Notice*, RM-9740, DA 99-2601 (rel. Nov. 19, 1999) (“*Public Notice*”).

optimize the ability to serve different geographic regions with various types and levels of communications traffic. Any mask adopted by the FCC should not penalize or preclude new satellite technologies that may be more spectrally efficient, but may result in somewhat higher out-of-band emissions than current technologies.

For example, “active antenna” technology will become increasingly important in satellite communications networks. This technology is the basis for electronically steerable phased array antennas, which are highly spectrally efficient (due to their ability to create multiple spot beams and thus reuse spectrum) and may be employed widely in both the space and earth stations of next-generation GSO and NGSO satellite systems. However, active antennas utilize amplifying devices within the antenna structure and thus have significantly less scope for post-amplifier filtering of transmissions than conventional satellite payloads. Therefore, the Commission should develop unwanted emissions rules that accommodate this and other developing technologies and do not unnecessarily preclude future innovation in satellite communications.

With respect to the specific issues raised by the Commission in the *Public Notice*, Astrolink’s preliminary responses are outlined below:

1. Should the generic out-of-band (OOB) mask be in dBc, dBs or PFD units or in some combination? Any OOB emission mask adopted by the Commission should be based on either a dBc or a dBs unit because, when expressed in these units, transmitter compliance with the performance standard can be tested easily on the ground prior to launch.² The OOB mask should not be expressed as a PFD limit because PFD is a function of the EIRP in the direction of

² The FCC's current unwanted emission mask employs a dBc approach and governs both OOB emissions and the spurious emissions. The 2000 World Radiocommunications Conference ("WRC-00") is expected to adopt a U.S.-backed proposal to make the spurious emission limit a dBc-based limit.

and the distance to a reference location and thus will vary with geographic location and over time (especially for NGSO satellites).

It is important to note, however, that an OOB emission mask expressed in dBc may not be appropriate in certain cases. For example, under a dBc approach, the allowable power of the OOB emission for some carrier types (typically wideband carriers) is actually greater than the power of the in-band emissions. However, adopting a dBs approach for OOB emissions while maintaining a dBc approach for spurious emissions could result in part of the OOB mask being more stringent than the spurious emission limit, even though the spurious emission limit is normally expected to be more stringent than the OOB emission limit. Thus, the issue of whether an unwanted emission mask should be expressed in dBc or dBs (or some combination) will require further study.

2. Should the emissions of a multi-carrier system with a wideband frequency allocation be treated differently than those of a system with a single broadband carrier? In applying spurious emission limits, the ITU Radio Regulations and ITU-R Recommendations make a distinction between a satellite transponder that carries a single carrier and one that is used for multiple carriers. In the former case, the ITU uses the necessary bandwidth of the single carrier to determine the frequency offset where the spurious emission limits apply; in the latter case, the ITU Radio Regulations state that the transponder bandwidth should be used. However, this issue is complicated by the fact that the notion of a conventional transponder does not apply to some new wideband satellite technologies. Thus, this issue should be the subject of additional study in the context of a rulemaking proceeding.

3. Should the mask be defined as a function of authorized bandwidth (FCC approach) or necessary bandwidth (ITU approach)? Although the term "authorized

bandwidth" is not clearly defined in the FCC's Rules for space station transmitters, it can reasonably be interpreted to mean the overall bandwidth that a licensee is authorized to use (*e.g.*, 500 MHz from 3.7-4.2 GHz in the case of a conventional C-band satellite). However, the FCC's Rules also contain a general definition of "assigned frequency band," which is closely related to the necessary bandwidth (*i.e.*, single carrier).³ It may be appropriate to consider using the overall bandwidth as the basis of the mask because a necessary bandwidth (*i.e.*, single carrier) approach may unnecessarily constrain in-band transmissions.

4. Should a generic mask be used for all space service allocations unless otherwise specified? Different space services, and even various transmissions within the same service (*e.g.*, wideband versus narrowband carriers), may employ various transmission schemes and technologies. For example, the modulation and beam forming techniques of an MSS or FSS satellite can be significantly different from that of a BSS satellite and, as a result, it is unclear at this time whether a single generic emission mask is appropriate or whether multiple masks are warranted.

5. Should the FCC Rules incorporate out-of-band values agreed in Recommendations of the ITU-R? Although it may be useful to have the FCC Rules incorporate OOB values contained in certain ITU-R Recommendations, particularly given the regional and global nature of satellite telecommunications, the needs of the U.S. satellite industry may not always coincide with the Recommendations adopted within the ITU-R. Thus, reference to any ITU-R Recommendation should be done on a case-by-case basis where the Recommendation is consistent with U.S. positions. In addition, the United States should work

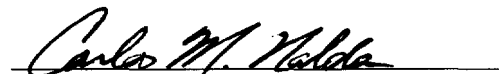
³ See 47 C.F.R. § 2.1(c).

within the ITU-R study group process to obtain international adoption of any new unwanted emissions mask that may be adopted by the Commission.

In conclusion, Astrolink supports commencement of a rulemaking proceeding to update the Commission's rules regarding satellite network unwanted emissions. Astrolink also believes that the technical issues associated with unwanted emissions require further study and that it may be useful for an informal industry working group to address these issues in the context of the rulemaking proceeding.

Respectfully submitted,

ASTROLINK INTERNATIONAL, LLC

A handwritten signature in cursive script, appearing to read "Carlos M. Nalda", is written over a horizontal line.

Raymond G. Bender, Jr., Esq.

Carlos M. Nalda, Esq.

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Its Attorneys

December 20, 1999

CERTIFICATE OF SERVICE

I, Cynthia S. Shaw, do hereby certify that on this 20th day of December, 1999, I caused a copy of the foregoing Comments of Astrolink International, LLC to be served upon each of the parties listed below:

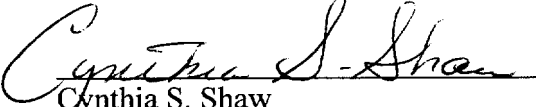
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